since the resultant silica is capable of dissolving much scale. Since, however, additional silica generally conies into the furnace in not inconsiderable quantities as an impurity of the metallic charge, and the additions in the furnace, and since this substance is the cause of the formation of large quantities of slag, a high silicon is not willingly employed ; it is frequently fixed at not more than 1 per cent, in the conditions attached to deliveries. In localities where scrap is considerably cheaper than pig iron, and where it is, therefore, most advantageous to work with the least possible pig iron, one may dispense with this restriction. Therefore, the risk is taken of having as much reducing agents as possible in the pig iron, as in the foregoing case; or also, if an after-addition of reducing agent is required for a too soft charge, one may employ highly siliceous brands of pig iron without reason to fear outstandings. It then involves, of course, taking quite special care in regard to the purity of the remaining materials in respect of high silica impurities.

In the open-hearth process, carbon plays the weightiest role of all the reducing agents. Its combustion diminishes a little the heat required, but its main action rests on the property of liberating a gaseous product of oxidation, which originates in the interior of the metal itself, and thereby brings the bath into motion, thus favouring exchange of heat between the flame and bath, also good reaction throughout the latter is rendered possible ; and through this alone the open-hearth process is capable of being carried out. The most favourable course is directly produced by the carbon content of the bath being correctly adjusted.

Now, the conditions under which pig iron is produced in the blast furnace admit of regulation of the carbon content only to a limited extent, because at the temperature employed a metal saturated with carbon always results. Therefore prescriptions cannot well be made for the carbon content of the pig iron, and it remains the task of the open-hearth furnace manager to correctly adjust the percentage of pig iron to scrap to suit the carbon content of the mixture.

In the open-hearth furnace, phosphorus likewise gives rise to a slight gain of heat, but nevertheless it is also an undesirable